

# Fast Track to the Cloud

## Design Patterns for 12-Factor Earth Sciences Applications

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IN21B-1725



As expanding service offerings and decreasing prices make the cloud increasingly attractive to Earth Science applications, there are nontrivial practical considerations which can hinder its meaningful use. In this talk, we will discuss architectural recommendations and lessons learned while working on EOSDIS' cloud efforts, particularly the NASA-compliant General Application Platform (NGAP) and its associated applications. Prominent in our findings is the importance of 12-factor design patterns and the powerful "wins" they enable in the cloud. We will share our strategies for "fast-tracking" applications to the cloud -- whether they be legacy, planned for the future, or somewhere in between.

Key patterns we will discuss that have significant effect on the ability to effectively onboard existing applications to a cloud platform include:

**Codebase:** All code for an application should be in revision control.

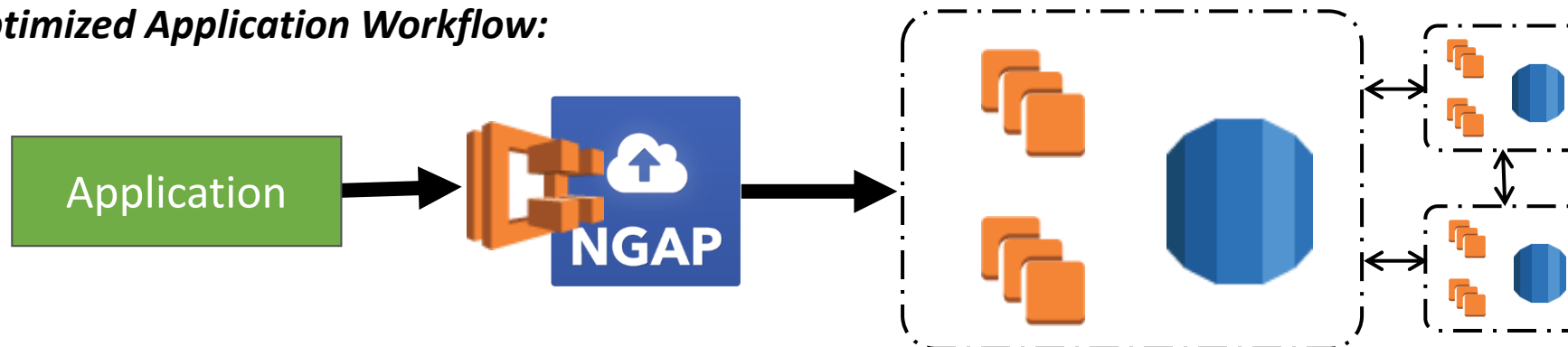
**Config:** Store all of the application's configuration in the environment rather than in static configuration files.

**Dev/Prod Parity:** Code deployed to a dev. environment should be deployable to operations with only configuration changes.

**Processes:** All application processes should be stateless, and nothing is shared. Data is either completely transient or stored in a data store.

**Disposability:** Startups and shutdowns should be graceful (even when unexpected) and as fast as possible.

### Optimized Application Workflow:



### Wins with Cloud-Optimized Workflow and Architecture:

**Cost:** Lowered costs from using shared cloud services and best practice architectures.

**Consistency:** Applications scale uniformly despite differences in technology.

**Compute:** Greater computational resources available, particularly close to actual data.

This material is based upon work supported by the National Aeronautics and Space Administration

under Contract Number **NNG15HZ39C**

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